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| EXAMINER | |
|---|---|
| WEST, JEFFREY R | |
| ART UNIT | PAPER NUMBER |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/591,897 | LANG, TOBIAS | |
| | Examiner | Art Unit | |
| | Jeffrey R. West | 2857 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *01 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,2 and 4-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 October 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Appeal Brief*

1. In view of the Appeal Brief filed on December 01, 2008, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below.

/Eliseo Ramos-Feliciano/
Supervisory Patent Examiner, Art Unit 2857

### *Specification*

2. The disclosure is objected to because of the following informalities:

On page 6, line 17, "the time $t_0$" should be ---the time $t_1$---.

Appropriate correction is required.

***Claim Objections***

3. Claims 1, 4, and 7 are objected to because of the following informalities:

In claim 1, line 4, to avoid problems of antecedent basis, "the ultrasonic transducer" should be ---the at least one ultrasonic transducer---.

In claim 1, line 6, to avoid problems of antecedent basis, "a value characteristic" should be ---a characteristic value---.

In claim 4, line 2, to avoid confusion, "whose input is" should be changed to something similar to ---comprising inputs that are respectively---.

In claim 7, line 1, to avoid confusion, "an ultrasonic signal (A0, B0)" should be ---an ultrasonic signal---.

In claim 7, line 4, to avoid problems of antecedent basis, "a value characteristic" should be ---a characteristic value---.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1, 2, and 4-8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled

in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 1 and 7 recite "wherein the receiver unit (4) determines a chronological position ($T_s$) of a focal point of either the ultrasonic signal or its envelope curve (6) as the characteristic value" and "wherein the receiver unit (4) determines a chronological position of a focal point of the ultrasonic signal or its envelope curve (6) as a characteristic value", respectively. The Examiner asserts, however, that the specification does not provide an adequate indication as to what constitutes the claimed "focal point" of the signal or its envelope curve and, therefore, does not sufficiently disclose such a feature to enable one skilled in the art to make/use the invention as claimed.

Turning to the specification, it is first disclosed:

> Fig. 6 shows a typical curve of the signal focal point as a function of the threshold voltage/signal amplitude ratio (page 6, lines 1-2).
>
> Fig. 7 shows the curve of an envelope curve focal point of the ultrasonic signal as a function of the threshold voltage/signal amplitude ratio (page 6, lines 4-5).

The Examiner asserts that Figure 6 fails to disclose any "focal point" and does not illustrate a focal point as a function of a threshold voltage/signal amplitude ratio, but instead illustrates a signal as a function of time as further disclosed by the specification:

> Fig. 6 shows the pulse width modulated output signal K1 of the first comparator 10. The individual high phases of the signal K1 can, for example, be stored and evaluated in various counters. The longest high phase indicates the maximum amplitude $Amp_{max}$ of the ultrasonic signal A0, B0 (page 7, lines 14-17).

The Examiner asserts that Figure 7 does illustrate Ts, defined as an envelope curve focal point, as a function of a threshold voltage/signal amplitude ratio, but such an illustration does not provide any understanding of a focal point.

Turning back to the specification, it is disclosed:

> According to a preferred embodiment form of the present invention, the envelope curve 6 focal point Ts of the ultrasonic signal A0, B0 is used as a characteristic value that is set in relation to the detected reception time to. The chronological focal point Ts of the envelope curve 6 can, for example, be determined from the following equation:
>
> $$T_s \sim \sum_{k=1}^{n} k * A(k) / \sum_{k=1}^{n} A(k),$$
>
> where k is a running index that describes the number of positive half-waves of the ultrasonic signal after the threshold SW is exceeded. A(k) is the amplitude of the $k^{th}$ half-wave after the threshold (trigger time) is exceeded (page 7, line 22 to page 8, line 3).
>
> Fig. 7 shows the curve of the signal focal point Ts as a function of the ratio of the threshold voltage USW to the signal amplitude Amp. Whenever the amplitude Amp of the ultrasonic signal A0, B0 changes so intensely that the threshold USW is exceeded one signal period earlier or later, then a jump occurs in the signal $T_s$ (page 8, lines 5-9).

The first cited section does appear to define the focal point of the envelope curve as $T_s \sim \sum_{k=1}^{n} k * A(k) / \sum_{k=1}^{n} A(k)$, however, written in this manner, it is unclear to one having ordinary skill in the art which terms are the numerator and which terms are the denominator and, therefore, one having ordinary skill in the art cannot make/use the invention as claimed. Additionally, this formula does not provide an indication as

to what constitutes the focal point aside from the formula itself which is given for the envelope focal point and, therefore, one having ordinary skill in the art cannot determine what constitutes the focal point for the ultrasonic signal itself. Adding further confusion, the second cited section indicates that "Fig. 7 shows the curve of the signal focal point Ts" when page 9 of the specification defines Ts as the "envelope curve focal point" and, as discussed above, the brief description of the Figures indicates that "Fig. 7 shows the curve of an envelope curve focal point of the ultrasonic signal as a function of the threshold voltage/signal amplitude ratio".

The Examiner also notes that Applicant's arguments presented on page 7 of the Appeal Brief filed December 01, 2008, states:

> The envelope curve focal point Ts (Fig. 6) of the ultrasonic signal (A0, B0) is used as the characteristic value set in relation to reception time $t_0$. The chronological focal point Ts of envelope 6 of a signal is determined, and the time difference $\Delta t$ from $t_0$ to same chronological focal point. Fig. 7 shows the curve of the single focal point Ts as a function of the ratio of the threshold voltage Usw to signal amplitude Amp (Fig. 6). Whenever the amplitude (Amp) of the ultrasonic signal changes so intensely that the threshold USW is exceeded, one signal period earlier or later, then a jump occurs in the signal Ts [page 7, lines 14-17; lines 23-27; and page 8, lines 5-9].

Therefore, Applicant indicates that Figure 6 illustrates the envelope curve focal point which, as discussed above, appears to have no illustration of any focal point, and Applicant also indicates that "Fig. 7 shows the curve of the single (sic) focal point Ts", contrary to the definition of Ts as the "envelope curve focal point" on page 9 of the specification and indication in the brief description of the Figures that "Fig. 7

shows the curve of an envelope curve focal point of the ultrasonic signal as a function of the threshold voltage/signal amplitude ratio".

For these reasons, the Examiner asserts that the specification does not provide adequate discussion as to what constitutes the claimed "focal point" of the signal or its envelope curve and, therefore, does not sufficiently disclose such a feature to enable one skilled in the art to make/use the invention as claimed.

Claims 2, 4-6, and 8 are rejected under 35 U.S.C. 112, first paragraph, because they incorporate the lack of enablement present in their respective parent claims.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1, 2, 4-6, and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is considered to be vague and indefinite because line 5 refers to "the ultrasonic signal". Claim 1, however, earlier presents "at least one ultrasonic transducer for transmitting and receiving ultrasonic signals". Therefore, since claim 1 earlier presents "ultrasonic signals", it is unclear to one having ordinary skill in the art as to which of the ultrasonic signals "the ultrasonic signal" refers.

Claim 2 is rejected under 35 U.S.C. 112, second paragraph, because it attempts to further limit parent claim 1, "wherein the receiver unit (4) determines a maximum amplitude ($Amp_{max}$) of the ultrasonic signal as a characteristic value". Claim 1,

however, already specifies that "the receiver unit (4) determines a chronological position (Ts) of a focal point of either the ultrasonic signal or its envelope curve (6) as the characteristic value" therefore making it unclear to one having ordinary skill in the art how claim 2 further limits parent claim 1.

Claim 8 is rejected under 35 U.S.C. 112, second paragraph, because it attempts to further limit parent claim 7, "wherein the receiver unit (4) determines a maximum amplitude ($Amp_{max}$) of the ultrasonic signal as a characteristic value". Claim 7, however, already specifies that "the receiver unit (4) determines a chronological position of a focal point of the ultrasonic signal or its envelope curve (6) as a characteristic value" therefore making it unclear to one having ordinary skill in the art how claim 8 further limits parent claim 7.

Claims 4-6 are rejected under 35 U.S.C. 112, second paragraph, because they incorporate the lack of clarity present in parent claim 1.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1, 2, 4, and 6-8, as may best be understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over JP Patent Application Publication No. 2003-050145 to Eshita et al. in view of U.S. Patent No. 5,390,676 to Katakura.

With respect to claim 1, Eshita discloses an ultrasonic flow sensor (0014, lines 1-4), comprising at least one ultrasonic transducer for transmitting and receiving ultrasonic signals (0014, lines 1-4), and a receiver unit connected to the ultrasonic transducer (0014, lines 4-12) that detects a predetermined event of the ultrasonic signal as a reception time (0029, lines 1-4), wherein the receiver unit determines a time of a value characteristic of the ultrasonic signal (0026, lines 1-16) as well as a time shift of the time relative to the reception time and uses the time shift to determine a correct time value for the reception time (0032, lines 1-13).

As noted above, the invention of Eshita teaches many of the features of the claimed invention and while Eshita does disclose an ultrasonic flow sensor including a receiver unit that determines a time of a value characteristic of the ultrasonic signal, Eshita is not explicit in specifying that the receiver unit determines a chronological position of a focal point of either the ultrasonic signal or its envelope curve as the characteristic value.

Katakura teaches an ultrasonic flowmeter comprising at least one ultrasonic transducer (column 3, lines 12-18) and a receiver unit (column 3, lines 19-31) wherein the receiver unit determines a chronological position of a focal point of the ultrasonic signal as a characteristic value being detected (column 3, lines 12-18 and 48-63).

It would have been obvious to one having ordinary skill in the art to modify the invention of Eshita to explicitly indicate that the receiver unit determines a

chronological position of a focal point of either the ultrasonic signal or its envelope curve as the characteristic value, as taught by Katakura, because, as suggested by Katakura, the combination would have improved the system of Eshita by providing means for specifying a specific focal point to be detected in the ultrasonic signals thereby allowing the device of Eshita to monitor the flow of specific targets resulting in increased applicability in a wider variety of flow monitoring applications (column 1, lines 14-19 and 51-67 and column 3, lines 12-18 and 48-68).

With respect to claim 2, the combination teaches the invention as claimed above and further Eshita discloses that the receiver unit determines a maximum amplitude of the ultrasonic signal as a characteristic value (0026, lines 1-16).

With respect to claim 4, the combination teaches the invention as claimed above and further Eshita discloses that the receiver unit includes a comparator whose input is supplied with a transducer output signal and a reference signal (0022, lines 1 to 0023, line 13), and the receiver unit determines a piece of information about the time of the characteristic value from an output signal of the comparator (0026, lines 1-16).

With respect to claim 6, the combination teaches the invention as claimed above and further Eshita discloses that the reception time is corrected as a function of the time shift (0032, lines 1-13).

With respect to claim 7, Eshita discloses a method for detection of an ultrasonic signal (0014, lines 1-4) in an ultrasonic transducer by means of a receiver unit (0014, lines 1-4), which detects a predetermined event of the ultrasonic signal as a reception time (0029, lines 1-4), wherein the receiver unit determines a time of a value characteristic of the ultrasonic signal (0026, lines 1-16) and determines a time shift of the time in relation to the reception time and uses the time shift to determine a correct time value for the reception time (0032, lines 1-13).

As noted above, the invention of Eshita teaches many of the features of the claimed invention and while Eshita does disclose an ultrasonic flow sensor including a receiver unit that determines a time of a value characteristic of the ultrasonic signal, Eshita is not explicit in specifying that the receiver unit determines a chronological position of a focal point of either the ultrasonic signal or its envelope curve as the characteristic value.

Katakura teaches an ultrasonic flowmeter comprising at least one ultrasonic transducer (column 3, lines 12-18) and a receiver unit (column 3, lines 19-31) wherein the receiver unit determines a chronological position of a focal point of the ultrasonic signal as a characteristic value being detected (column 3, lines 12-18 and 48-63).

It would have been obvious to one having ordinary skill in the art to modify the invention of Eshita to explicitly indicate that the receiver unit determines a chronological position of a focal point of either the ultrasonic signal or its envelope curve as the characteristic value, as taught by Katakura, because, as suggested by

Katakura, the combination would have improved the system of Eshita by providing means for specifying a specific focal point to be detected in the ultrasonic signals thereby allowing the device of Eshita to monitor the flow of specific resulting in increased applicability in a wider variety of flow monitoring applications (column 1, lines 14-19 and 51-67 and column 3, lines 12-18 and 48-68).

With respect to claim 8, the combination teaches the invention as claimed above and further Eshita discloses that the receiver unit determines a maximum amplitude of the ultrasonic signal as a characteristic value (0026, lines 1-16).

10. Claims 1, 2 and 4-8, as may best be understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art in view of JP Patent Application Publication No. 2003-050145 to Eshita et al. and further in view of U.S. Patent No. 5,390,676 to Katakura.

With respect to claim 1, Applicant admits as prior art an ultrasonic flow sensor (page 1, line 22 and Figure 1 – page 5, line 17), comprising at least one ultrasonic transducer for transmitting and receiving ultrasonic signals (page 1, lines 22-24 and 26-28 and Figure 1 – page 5, line 17), and a receiver unit connected to the ultrasonic transducer (page 6, line 30 to page 7, line 2) that detects a predetermined event of the ultrasonic signal as a reception time (page 6, lines 29-30), wherein the receiver

unit determines a time of a value characteristic of the ultrasonic signal (page 7, lines 4-6)

As noted above, the invention of AAPA teaches many of the features of the claimed invention and while Applicant does admit as Prior Art determining a reception time as well as a time value of a characteristic value of the ultrasonic signal, Applicant does not explicitly admit as prior art correcting the reception time based on a time shift of a time of the characteristic value relative to the reception time.

Eshita discloses an ultrasonic flow sensor (0014, lines 1-4), comprising at least one ultrasonic transducer for transmitting and receiving ultrasonic signals (0014, lines 1-4), and a receiver unit connected to the ultrasonic transducer (0014, lines 4-12) that detects a predetermined event of the ultrasonic signal as a reception time (0029, lines 1-4), wherein the receiver unit determines a time of a value characteristic of the ultrasonic signal (0026, lines 1-16) as well as a time shift of the time relative to the reception time and uses the time shift to determine a correct time value for the reception time, wherein the reception time is corrected as a function of the time shift (0032, lines 1-13).

It would have been obvious to one having ordinary skill in the art to modify the invention of AAPA to explicitly include correcting the reception time based on a time shift of a time of the characteristic value relative to the reception time, as taught by Eshita, because, as suggested by Eshita, the combination would have improved the system of AAPA by correcting for incorrect wave arrival timing to increase the

precision of the arrival timing resulting in greater accuracy in the flow determination of AAPA (0007, lines 2-15).

As noted above, the invention of AAPA and Eshita teaches many of the features of the claimed invention and while the invention of AAPA and Eshita does disclose an ultrasonic flow sensor including a receiver unit that determines a time of a value characteristic of the ultrasonic signal and corrects a reception time based on a time shift of a time of a characteristic value relative to the reception time, the combination is not explicit in specifying that the receiver unit determines a chronological position of a focal point of either the ultrasonic signal or its envelope curve as the characteristic value.

Katakura teaches an ultrasonic flowmeter comprising at least one ultrasonic transducer (column 3, lines 12-18) and a receiver unit (column 3, lines 19-31) wherein the receiver unit determines a chronological position of a focal point of the ultrasonic signal as a characteristic value being detected (column 3, lines 12-18 and 48-63).

It would have been obvious to one having ordinary skill in the art to modify the invention of AAPA and Eshita to explicitly indicate that the receiver unit determines a chronological position of a focal point of either the ultrasonic signal or its envelope curve as the characteristic value, as taught by Katakura, because, as suggested by Katakura, the combination would have improved the system of AAPA and Eshita by providing means for specifying a specific focal point to be detected in the ultrasonic signals thereby allowing the device of AAPA and Eshita to monitor the flow of

specific targets resulting in increased applicability in a wider variety of flow monitoring applications (column 1, lines 14-19 and 51-67 and column 3, lines 12-18 and 48-68).

With respect to claim 2, the combination teaches the invention as claimed above and further Applicant admits as prior art that the receiver unit determines a maximum amplitude of the ultrasonic signal as a characteristic value (page 7, lines 4-6).

With respect to claim 4, the combination teaches the invention as claimed above and further Applicant admits as prior art that the receiver unit includes a comparator whose input is supplied with a transducer output signal and a reference signal (page 6, line 30 to page 7, line 2 and Figure 5 – page 5, line 29), and the receiver unit determines a piece of information about the time of the characteristic value from an output signal of the comparator (page 7, lines 2-6).

With respect to claim 5, the combination teaches the invention as claimed above and further Applicant admits as prior art that the reference signal supplied to the comparator is a threshold not equal to zero (page 6, line 30 to page 7, line 4 and page 7, lines 14-15) and the output signal of the comparator is a pulse width modulated signal from which the time of the characteristic value is determined (page 7, lines 4-6 and 14-15).

With respect to claim 6, as noted above, the invention of AAPA teaches many of the features of the claimed invention and while Applicant does admit as Prior Art determining a reception time as well as a time value of a characteristic value of the ultrasonic signal, Applicant does not explicitly admit as prior art correcting the reception time based on a time shift of a time of the characteristic value relative to the reception time.

Eshita discloses an ultrasonic flow sensor (0014, lines 1-4), comprising at least one ultrasonic transducer for transmitting and receiving ultrasonic signals (0014, lines 1-4), and a receiver unit connected to the ultrasonic transducer (0014, lines 4-12) that detects a predetermined event of the ultrasonic signal as a reception time (0029, lines 1-4), wherein the receiver unit determines a time of a value characteristic of the ultrasonic signal (0026, lines 1-16) as well as a time shift of the time relative to the reception time and uses the time shift to determine a correct time value for the reception time, wherein the reception time is corrected as a function of the time shift (0032, lines 1-13).

It would have been obvious to one having ordinary skill in the art to modify the invention of AAPA to explicitly include correcting the reception time based on a time shift of a time of the characteristic value relative to the reception time, as taught by Eshita, because, as suggested by Eshita, the combination would have improved the system of AAPA by correcting for incorrect wave arrival timing to increase the

precision of the arrival timing resulting in greater accuracy in the flow determination of AAPA (0007, lines 2-15).

With respect to claim 7, Applicant admits as prior art a method for detection of an ultrasonic signal in an ultrasonic transducer (page 1, lines 22-24 and 26-28 and Figure 1 – page 5, line 17) by means of a receiver unit (page 6, line 30 to page 7, line 2), which detects a predetermined event of the ultrasonic signal as a reception time (page 6, lines 29-30), wherein the receiver unit determines a time of a value characteristic of the ultrasonic signal (page 7, lines 4-6).

As noted above, the invention of AAPA teaches many of the features of the claimed invention and while Applicant does admit as Prior Art determining a reception time as well as a time value of a characteristic value of the ultrasonic signal, Applicant does not explicitly admit as prior art correcting the reception time based on a time shift of a time of the characteristic value relative to the reception time.

Eshita discloses an ultrasonic flow sensor (0014, lines 1-4), comprising at least one ultrasonic transducer for transmitting and receiving ultrasonic signals (0014, lines 1-4), and a receiver unit connected to the ultrasonic transducer (0014, lines 4-12) that detects a predetermined event of the ultrasonic signal as a reception time (0029, lines 1-4), wherein the receiver unit determines a time of a value characteristic of the ultrasonic signal (0026, lines 1-16) as well as a time shift of the time relative to the reception time and uses the time shift to determine a correct time

value for the reception time, wherein the reception time is corrected as a function of the time shift (0032, lines 1-13).

It would have been obvious to one having ordinary skill in the art to modify the invention of AAPA to explicitly include correcting the reception time based on a time shift of a time of the characteristic value relative to the reception time, as taught by Eshita, because, as suggested by Eshita, the combination would have improved the system of AAPA by correcting for incorrect wave arrival timing to increase the precision of the arrival timing resulting in greater accuracy in the flow determination of AAPA (0007, lines 2-15).

As noted above, the invention of AAPA and Eshita teaches many of the features of the claimed invention and while the invention of AAPA and Eshita does disclose an ultrasonic flow sensor including a receiver unit that determines a time of a value characteristic of the ultrasonic signal and corrects a reception time based on a time shift of a time of a characteristic value relative to the reception time, the combination is not explicit in specifying that the receiver unit determines a chronological position of a focal point of either the ultrasonic signal or its envelope curve as the characteristic value.

Katakura teaches an ultrasonic flowmeter comprising at least one ultrasonic transducer (column 3, lines 12-18) and a receiver unit (column 3, lines 19-31) wherein the receiver unit determines a chronological position of a focal point of the ultrasonic signal as a characteristic value being detected (column 3, lines 12-18 and 48-63).

It would have been obvious to one having ordinary skill in the art to modify the invention of AAPA and Eshita to explicitly indicate that the receiver unit determines a chronological position of a focal point of either the ultrasonic signal or its envelope curve as the characteristic value, as taught by Katakura, because, as suggested by Katakura, the combination would have improved the system of AAPA and Eshita by providing means for specifying a specific focal point to be detected in the ultrasonic signals thereby allowing the device of AAPA and Eshita to monitor the flow of specific targets resulting in increased applicability in a wider variety of flow monitoring applications (column 1, lines 14-19 and 51-67 and column 3, lines 12-18 and 48-68).

With respect to claim 8, the combination teaches the invention as claimed above and further Applicant admits as prior art that the receiver unit determines a maximum amplitude of the ultrasonic signal as a characteristic value (page 7, lines 4-6).

***Response to Arguments***

11. Applicant's arguments with respect to claims 1, 2, and 4-8 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to

Applicant's disclosure.

U.S. Patent No. 4,933,915 to Bolstrom teaches a method of indicating the time of an acoustic pulse and a device for carrying out the method comprising a transducer with reception means (column 4, lines 12-18) for determining a reference time by detecting a chronological position of an envelope curve as a characteristic value (column 3, lines 18-25 and column 4, line 61 to column 5, line 5).

U.S. Patent No. 4,583,410 to O'Neil teaches a timing circuit for acoustic flow meters.

U.S. Patent No. 4,603,589 to Machida teaches an ultrasonic flowmeter.

U.S. Patent No. 4,922,750 to Magori teaches an ultrasound phase difference method for measuring high flow rates.

U.S. Patent No. 5,035,147 to Woodward teaches a method and system for digital measurement of acoustic burst travel time in a fluid medium.

U.S. Patent No. 6,634,240 to Wallen teaches a zero crossing detector and method for determining a zero crossing point.

U.S. Patent No. 5,421,212 to Mayranen et al. teaches a method and device in acoustic flow measurement for ensuring the operability of said measurement.

U.S. Patent No. 4,542,656 to Johnson teaches fluid flow monitoring.

U.S. Patent No. 4,022,058 to Brown teaches an apparatus for determining the arrival time of alternating signals.

13. Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jeffrey R. West whose telephone number is (571)272-2226. The examiner can normally be reached on Monday through Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eliseo Ramos-Feliciano can be reached on (571)272-7925. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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